SYMONS'S

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METEOROLOGICAL EXHIBITION AT SOUTHPORT.

WE have pleasure in calling the attention of our readers to the following circular which has recently been issued, and to which it is hoped there will be a hearty response.

METEOROLOGICAL OFFICE, S.W., *May 19th*, 1903.

DEAR SIR,—In connection with the meeting of the International Meteorological Committee, at Southport, during the session of the British Association in September next, it is proposed to make arrangements for an Exhibition of Meteorological appliances and other objects of Meteorological interest.

Upon the initiative of the Meteorological Council, with the co-operation of the Royal Meteorological Society and the Scottish Meteorological Society, who have appointed representative members, a Committee has been formed to carry out this proposal.

In order to divide the work of collection and organisation it is proposed to group the exhibits into four classes; those who are willing to co-operate are requested to communicate at once with the gentlemen named below, who have kindly undertaken to receive, on behalf of the Committee, intimations and suggestions as to objects of meteorological interest proposed for exhibition.

A. Meteorological Statistics Dr. H. R. Mill, 62, Camden Square, N.W.

B. Weather Telegraphy ... Mr. W. N. Shaw, 63, Victoria Street, S.W.

C. Atmospheric Physics ... Capt. Wilson-Barker, H.M.S. Worcester, Greenhithe, Kent.

including (*a*) Meteorological Photography; (*b*) Instruments, and Instrumental records; (*c*) High Level Stations, Balloons and Kites; observations and records; (*d*) Experimental illustrations.

D. The relation of Meteorology to other branches of Physics Mr. A. R. Hinks, The Observatory, Cambridge.

The opportunities for a gathering of the meteorologists of other countries in the United Kingdom have been comparatively rare. The committee invite workers in meteorology and allied branches of physics to co-operate on this occasion in the formation of an Exhibition which shall adequately represent the position of this country with regard to the prosecution of those sciences.

The Meteorological Council have sanctioned a proposal to have a selection of the official telegraphic reports repeated daily to Southport during the meeting, to be charted and dealt with by a member of the staff of the Office in connection with the Exhibition.

I am, dear sir, yours faithfully, W. N. SHAW.

Correspondence.

THE THUNDERSTORMS OF MAY 30TH AND 31ST.

To the Editor of Symons's Meteorological Magazine.

PERHAPS some few particulars of the violent storms that occurred here last Saturday will be welcome. When I got back from London, at 3.30 p.m., and was in this road, I noticed thunder clouds (cumulo-nimbus) to the N.W., N.E. and S.W. of this house. The N.W. storm seemed to pass away, but the N.E. and S.W. storms seemed to coalesce just over this house. The rain, and hail, and lightning began at 4.10 p.m., the thunder having been heard since 3.30 p.m. At 4.26 p.m. there was a terrific flash of lightning, followed instantly by a violent peal of thunder. This flash, it afterwards appeared, struck two houses in this road, doing damage to the roofs and chimney, and also one in the Manor Road, close by, breaking a window and burning the frame, and doing damage to a chimney. From 4.10 to 5.10 the rain and hail came down in torrents, practically sweeping the paths of all mud and sand. At 5.10 the rain began to abate, and at 5.15 only a very few drops were falling; so I measured the water in the gauge and found 2·77 in., all of which fell in 1 hr. 5 min. A few drops were still falling, and it came on again much heavier with hail, and thunder, and lightning. At 6.20 the rain ceased, so I measured the gauge again, and found ·25 in. in 1 hr. 5 mins., making a total of 3·02 in. in 2 hrs. 10 mins. It continued fine till midnight, when another storm came up from the S.E. This storm, with lightning and thunder, lasted till 3 a.m. on the 31st. The rain beginning at 2 a.m., lasted, as near as I can make out, an hour. When measured at 9 a.m. there was ·11 in.; making a total of 3·13 in. Under the railway bridge, where the rain always collects, there must have been over 3 feet of water, for it reached the point of the collar of our milkman's pony. There was 2 ft. 9 in. of water in my greenhouse. My next door neighbour, who had lived over nine years in Ceylon, had never before seen such rain. The damage to our roads is estimated at over £1,000. One of the largest hailstones measured $\frac{3}{4}$ in. in diameter. I have the following returns for the 30th exceeding 1·00 in.: Beddington Corner, 3·67 in. (3·50 in. fell in just under one hour); Wallington, 3·13 in. as stated above; Beddington, 2.29 in. (2·10 in. fell between 4.15 and 6 p.m.); Wimbledon Sewage Works, 2·26 in. (1·58 in. fell between 4.10 and 5.30 p.m.); Duppas House, Croydon, 1·85 fell in 2·84 hours (·80 in. fell in 15 minutes); Waddon New Road, Croydon, 1·85 in. (1·75 in. fell between 4.30 and 6.15 p.m.); Richmond, 1·34 in.; Brimstone Barn, Croydon, 1·32 in.; Park Hill Rise, Croydon, 1·32 in.; and Morden, 1·15 in.

F. CAMPBELL BAYARD.

Cotswold, Wallington, Surrey, 8th June, 1903.

ON May 28th a sharp thunderstorm passed over this district (East Surrey) between 11.20 a.m. and noon, the lightning being very vivid and the thunder following without any appreciable interval.

On the 30th, after a "close," though fine, forenoon (shade temperature 75°), a heavy thunderstorm approached from the westward shortly after 3 p.m., and from 4.5 to 4.48 p.m. lightning and thunder were incessant, not a drop of rain falling the while. The "time interval" varied from two or three seconds to a negligible quantity. Between 5.8 and 6.15 p.m. rain descended fairly heavily, 0·49 in. being found in the gauge at the latter time. Hail fell with great force for a very short period.

On the 31st, at 2 a.m., an even more violent storm occurred, it being impossible to count the time interval from that hour to 2.30 a.m., on account of the continual illumination of the sky by lightning and the incessant rumble of thunder. A tree was "scorched" in the garden here. The rainfall during this storm amounted to 0·24 in., which practically all descended in ten minutes, 2.30—2.40 a.m.

I should not venture to trespass upon your space with these notes, were it not for the fact that a succession of thunderstorms of such a violent character is very unusual in this neighbourhood.

D. W. HORNER.

Clapham Park, S.W., June 8th, 1903.

A TERRIFIC thunderstorm visited this locality on the 30th to 31st of May. Time taken by marine chronometer checked by regulator, both of known rate, 11.55 p.m. 30th, to 2 a.m. 31st, G.M.T. Lightning and thunder almost continuous. Severe vibration of doors and windows. Lightning at times apparently going up from the ground. I thought I saw globular lightning, but am probably mistaken, as this is of course very rare. The rainfall was ·60 in. Intense heat was experienced both on the 30th and 31st. Slight thunderstorms followed on June 1st, 6.10 p.m., and 8.10 a.m. June 2nd; the rainfall of which together was ·29 in.

F. H. PHILLIPS, F.R.Met.Soc.

Burgess Hill, Sussex, 2nd June, 1903.

IN case you wish for any details of the great storms of Saturday and Sunday last, I may mention that thunder began about 2 p.m. Rain began at 4 p.m., and was very heavy until 5.30, ceasing about 6 p.m. The lightning and thunder were very nearly simultaneous about 4.30 to 5 p.m. Another storm came on about 2 a.m. on the 31st, with sharp but short rain. Total rain, measured 9 a.m. of 31st, 1·06 in., of which about ·90 in. fell in the first storm, ·16 in the second.

G. SEARLE.

30, Edith Road, West Kensington, June 2nd, 1903.

[At Camden Square the thunderstorms were characterised by brilliant lightning and loud long-continued reverberations of thunder, especially on the early morning of the 31st. The remarkable feature was the absence of rain, only ·05 in. being recorded in the twenty-four hours, of which ·025 in. fell between 5.30 and 6.45 p.m. on the 30th, after the first storm, and ·025 in. between 2.30 and 3.20 a.m. on the 31st.

The extremely local nature of the rainfall is well brought out by the letters of our correspondents. We had hoped to discuss the rainfall of May in some detail, as the distribution is remarkable in several ways, but for some cause, which we can only surmise to be the unusual date of the Whitsuntide holidays, so many of our most faithful monthly observers have failed to send in their reports in time, that the intention has to remain unfulfilled.—ED. *.SM.M.*]

SYSTEMATIC CLOUD PHOTOGRAPHY.

To the Editor of Symons's Meteorological Magazine.

A GOOD deal is being done now towards the study of cloud forms by means of photography, but, so far as I know, at no station are photographs of the face of the sky taken regularly as part of the daily observations. One reason for this may be that on many days it is not possible to take any photographs, but I venture to think that for forecasting purposes, or at any rate, as part of the records of the station, photographs taken daily as often as practicable would be of value.

It is difficult by any description to give an accurate impression of the state of the sky as regards cloud forms, and in the hands of a skilled observer the camera should be able to afford useful and exact information.

I do not know whether the Rev. S. Barber has photographed the cirrus cloud form which he has described in his letter in the February number headed "On some Precursors of Weather Change," and which he has several times found to precede fine weather; such a photograph would be valuable, and if it be found that certain types or sequences of types of cloud go before or accompany certain phases of weather something will have been gained. For this purpose the series of daily photographs should be compared with the published weather maps. FRANCIS DRUCE.

65, Cadogan Square, S. W., May 3rd, 1903.

THE ORIGIN OF CYCLONE HEAT.

BY L. C. W. BONACINA.

IN endeavouring to ascertain the precise causes of the observed development and distribution of cyclone heat, we have obviously to deal with the combined thermal effect of a number of different temperature factors. Evidently, then, we must first of all strive to

disassociate these factors, in order that, when we consider more particularly the effect due to one of them, we may be able to detect, and make proper allowance for, the influence of each of the others. In the present article we propose to discuss solely the cyclones of North-Western Europe, for although the broad features of these low pressure systems* are the same all over the world, there are so many minor peculiarities distinguishing between British storms and those of the tropics, that the laws controlling their energy and movements are not the same in the several climatic zones.

We may classify the chief agents which exert a more or less direct influence upon the temperature of the lower air in a cyclonic disturbance under the following heads: (*a*) radiation, solar or terrestrial, (*b*) the physical conditions of that portion of the Earth's surface which the cyclone is traversing, (*c*) the direction of the wind, (*d*) the condensation of vapour into clouds and rain, (*e*) the peculiar properties of cyclone action itself. The influence of radiation need not concern us much in our investigation into the origin of cyclone heat, provided, of course, that we are always mindful of its existence, so as to be able to judge to what extent a given degree of heat or cold may be due to its operation. Every one, of course, knows that the high temperature experienced in the front of a cyclone is not the result of direct solar radiation, inasmuch as the sky is almost invariably thickly overcast. Moreover, in these latitudes the altitude of the midwinter sun is so low that the direct rays, even when freely transmitted through the atmosphere, do not appreciably warm that portion of it in contact with the soil, as we know from the fact that in frosty anti-cyclonic weather the mid-day shade temperature frequently remains below the freezing point, though the ground may be free from snow.

It is quite conceivable that a body of warm water such as, for instance, the Gulf Stream, should be capable of effecting a very considerable rise of temperature in any mass of air that may happen to be crossing its track. Now, knowing that the specific gravity of air as compared with water is $\frac{1}{773}$, and the specific heat ·2375 (Cp.) we can easily calculate that one cubic metre of water cooling 1 degree suffices to raise 773 cubic metres of air 4·2 degrees in temperature, or, in a more general form, x cubic metres of water in cooling t degrees emit enough heat to raise the temperature of $773x$ cubic metres of air $\frac{t}{4\cdot2}$ degrees. Hence we see how potent must be the influence of a stream of warm water, like the Gulf Stream, in heating the super-incumbent air. Now we most readily allow that when, as often happens, a westerly or south-westerly current of air blows straight across these islands from off the

* We must be careful to use the word "cyclone" in the meteorological and not in the popular sense. Tornadoes, waterspouts and storms of that class, which are usually styled "cyclones" are of a totally different nature, and are not influenced by the Earth's axial rotation.

Atlantic, a fairly uniform distribution of high temperature will be experienced, due to the convection of thermal energy from the waters of that ocean river. We are not entitled, however, to assume, as is frequently done in text books of physical geography, that the high temperatures associated with the wet and stormy weather of winter cyclones, are mainly due to the fact that storm systems usually cross the Gulf Stream before they reach us; for we have every reason to believe that the motion of propagation of a cyclone is of the nature of a wave, and that the wind is not moved forward by the system in its progress, the atmospheric disturbance always affecting fresh masses of air. Thus the winds revolving around the baric minimum do not partake of the motion of translation of the depression, but as the low pressure area advances fresh draughts of air are continually drawn in, which, in turn, are speedily left behind. Such facts as these are sufficient to warrant the belief that the direct influence of the Gulf Stream is imperceptible during the passage of a cyclonic disturbance across these islands.

It may be taken as a general rule that a south-westerly wind blowing across Great Britain from a considerable distance, will tend to deflect the isotherms north-eastwards, while conversely, a north-easterly draught of air flowing over the country from the Arctic regions, will tend to drive them south-westwards, and doubtless, the relative distribution of heat and cold is in large measure determined by this element; but it cannot be denied that the effect is greatly over-estimated. That the high temperature of a cyclone front is not altogether due to the southerly direction of the wind is proved by the fact that, when, as rarely happens, a depression moves westwards, the greatest development of heat occurs with northerly winds, which then blow in front of it; in addition to this we have the fact that the easterly winds of the northern half of an ordinary eastward moving cyclone, are characterized by the same quality of heat as the westerly winds of the southern half, though in a less marked degree. Since, however, the influence of the direction of the wind upon the temperature of the air in a cyclone will depend largely upon the shape, size and intensity of the system, as well as on the surrounding distribution of pressure and temperature, we ought not to state too definitely what the normal effect may be. Suffice it to say, that the magnitude of this influence is a considerable, though very variable quantity, being essentially dependent upon the temperature of the region from which the wind is blowing.

The latent heat liberated by the condensation of moisture into clouds and rain owing to the ascending motion of the atmosphere, is often urged as the primary cause of the excessively high temperatures observed in cyclone fronts; but this can only be influential in retarding the cooling of the ascending masses of air, or in checking the formation of frost, and would certainly be incompetent to produce the great increase of temperature

from near the freezing point to well over 50° F., such as constantly marks the passage of a deep cyclonic disturbance across Great Britain in winter time. Moreover, Abercromby has shown that, though the greatest development of both damp and heat is usually associated with the right front quadrant of a depression, there is no mutual relationship between the height of the thermometer and the amount of rainfall, inasmuch as the heaviest precipitation sometimes occurs in the rear of the trough, after temperature has commenced to fall. The true explanation of cyclone heat would seem to be that afforded by Abercromby in 1875, who suggested that the air in the front portion of a cyclone underwent a compression, adequate to produce the observed high temperature. He took the analogous case of a leaf swirl and called attention to the fact that the leaves were most densely packed together on that side of the swirl where the motions of rotation and translation coincided.

The present writer, however, is disposed to think that the thermal energy evolved in a cyclonic eddy is not merely the result of simple compression, but is also due to internal friction or viscosity consequent upon the enormous shearing stress to which the revolving particles of air must be subjected, part of the energy of this shearing being ultimately dissipated as heat. That there is great aërial compression will be evident when we consider the precise nature of cyclonic circulation. In the first place we know that in a cyclone the air moves spirally inwards towards the centre, in a direction, in this hemisphere opposite to that of the hands of a watch. We also know that the air does not flow directly into the centre, but tends more and more in virtue of centrifugal force exerted upon it, to keep away therefrom, thus increasing the barometric gradient.

The velocity of the wind, *cæteris paribus*, increases as the distance from the central area is diminished, and the centrifugal force then increases as the square root of the cube of the increase of velocity. The result must be obvious to anyone possessed of the true conception of the nature of a cyclone whirl. If there be a constant influx of air into the cyclonic vortex, and if this very air, as it draws near the central calm area, tends as a body to keep away from it, flowing into it only very gradually, the whole whirling mass must undergo great compression, sufficient to produce important thermal effects.

Passing from these theoretical considerations to the observed facts, we find that the greatest inflow of wind, as well as the steepest gradients, occurs in the right front quadrant of a cyclone, the very region which is characterized by the highest temperatures. The justice of these remarks will, we think, be acknowledged by all those who make a systematic study of synoptic charts. It is a noteworthy fact, moreover, that a depression of temperature almost invariably accompanies the rear of a cyclone, where the wind blows nearly parallel to the isobars, being frequently even a little out-curved, instead of in-curved, as in the front. There will thus be no abnormal development of heat due to compression in the rear portion;

in fact, the tendency will not uncommonly be towards a rarefaction of the air, and in this way we may account for the unusual reduction of temperature, occasionally experienced after the barometer has begun to rise along the line of the trough. The inference, then, that we draw from these considerations is, that the air in the front of a cyclone is dynamically warmed by a compression and agitation of its particles, consequent upon the action of centrifugal force at the centre, with a concomitant force, due to the steepness of the barometric gradients, causing air to be sucked into the vortex from all points at the outskirts.

In conclusion, we would observe that we are not justified in expecting to be able to detect any indication of compression upon an isobaric chart. We are only entitled to assert that pressure increases far more rapidly and irregularly outwards from the centre than it would do if compression effects were absent; in other words, if we could conceive of a cyclone characterised by the action of no centrifugal force and consequent compression, both the depth and intensity of the system would be diminished, that is to say, the centre baric minimum would be higher, and the barometric gradients less steep and irregular than those actually observed.

ROYAL METEOROLOGICAL SOCIETY.

THE first of the afternoon meetings of the present session was held at the Society's Rooms, 70, Victoria Street, Westminster, on May 20th, Capt. D. Wilson-Barker, F.R.S.E., President, in the chair.

Lieut. C. St.B. Sladen, R.E., was elected a Fellow of the Society.

Mr. C. P. Hooker read a paper on "The relation of the Rainfall to the depth of water in a Well," in which he gave the weekly measurements of the depth of water in a well 101 feet deep at Further Barton, Cirencester, compared with the weekly rainfall for the 16 years 1887-1902. The author's conclusions are as follows:—

The depth of water in the well depends on how much rain penetrates the soil, and this is determined by the amount of rain, the rapidity of its fall, and the existing condition of the soil, which in turn depends on the frequency of the falls of rain and the amount of evaporation. Therefore winter rains penetrate easily, summer rains with difficulty; but summer rains, especially when accompanied by lessened evaporation, tend to moisten the soil, and the water-level does not fall so rapidly. Evaporation has but little effect till April or May; but from that time until the end of September the evaporation is almost as great as the rainfall, and sometimes even greater. However heavy the winter rains are, and however full the well becomes in consequence, it by no means precludes the possibility of scarcity in the summer or autumn; but should the well be full in March, want is not probable. The well is filled sufficiently every winter, and no amount of extra rain will improve matters; therefore

scarcity in summer or autumn depends on what happens later, and especially in the spring months, when a deficiency of rain and subsequent heat and evaporation are important factors. After the early spring months, but little rain usually penetrates to the well, so that a timely forewarning at that season might prove of great value by enabling the existing supplies to be husbanded at an early period.

Considering how narrow the boundary is between sufficiency and want, and looking to the fact that every year sees further demands made on our water supplies, it is of the utmost importance that attention should be paid to the storage of the surplus winter rains. This might be done by the formation of large hill reservoirs, and doubtless such measures as the re-afforesting of extensive tracts of land would check the rapidity with which the rains reach the rivers, and are so lost.

In the discussion which followed the President, Admiral J. P. Maclear, Mr. Baldwin Latham, Colonel T. English, Dr. H. R. Mill, Mr. Clayton Beadle, Mr. J. Hopkinson, and Mr. R. H. Hooker took part, and Mr. C. P. Hooker replied.

Mr. W. Marriott gave an account of the "Frost of April, 1903." The weather from January 19th to March 31st was very mild, the mean temperature at Greenwich for this period of 72 days being 45°·2, which was 5°·7 above the average. Normal or cooler weather prevailed during the first 11 days of April, but on the 12th (Easter Sunday) an abrupt change took place which continued until the 27th. During this time low temperatures prevailed, accompanied by keen northerly winds and great dryness.

The main features are shown by the following values for the Royal Observatory, Greenwich :—

1903.	Jan. 19th-March 31st.	April.	April 12th-25th.
	°	°	°
Temperature—Mean	45·2	44·1	40·8
,, Mean Max. ...	51·2	52·0	49·6
,, Mean Min. ...	39·2	36·7	32·5
Dew Point Temperature	38·9	35·2	29·5
Relative Humidity	79%	71%	64%

Taking England and Wales as a whole there were 10 nights during April on which the temperature fell to 32° or below, 9 of which were between the 12th and 25th. The number of frosts on the grass was very great, there being as many as 23 during the month at Hodsock, and 22 at Bennington and Churchstoke. Snow and hail showers were frequent between the 12th and 17th, especially in the north-east and east of the country. The snow was general over most parts of the Continent, and was so heavy in Denmark and Russia as to stop railway traffic.

One of the special features of the period 12th–25th was the great radiation, the minimum temperature on the grass at several stations being 12° below that in the air, while at Southport the great difference of 16° was recorded on the 17th. Owing to the mildness

of the weather during February and March vegetation was in a very forward condition, and consequently suffered severely from the frost. The destruction of the fruit blossom was great and general.

In the discussion which followed the President, Mr. H. Southall, Mr. Baldwin Latham, Mr. C. Harding, and Mr. D. W. Horner took part, describing the effects of the frost in their respective neighbourhoods.

REVIEW.

Handbook of Climatology. By DR. JULIUS HANN. *Part I., General Climatology.* Translated by ROBERT DE COURCY WARD. New York: The Macmillan Company. London: Macmillan & Co., Ltd., 1903. Size 9 × 6. Pp. xvi. + 438. Price 12s. 6d. net.

PROFESSOR WARD of Harvard has conferred a benefit on the English-speaking world by the publication of Professor Hann's standard treatise on Climatology in an English translation. The translation is so well done and the translator has incorporated so many references to points specially interesting to his readers that the book has a just claim to be treated as an original contribution to science. Like everything emanating from Professor Hann the *Climatology* is characterised by a union of accurate detail and wide grasp of principles, unapproached by any other meteorological writer.

The book under review must not, however, be looked upon as a complete work, for it is the first of three volumes, the two which have not been translated dealing with the more geographical aspect as this one deals with the more meteorological aspect of climatology. The translation of the other volumes Professor Ward found impracticable, and indeed they are so crammed with facts and figures that the language is almost unimportant; any serious student without a special knowledge of German can refer to their pages with a very moderate use of a dictionary. It is different with the general volume, which is adapted for reading as the others are suited for reference; hence our gratitude to Professor Ward.

To some extent the book is edited as well as translated; there are some omissions concerning "matters of special interest to European students only" and some additions which concern the American student mainly. While very fair reference is made to the sources of information as to British climate, readers in this country will miss many illustrations that might have been adduced in the text to throw light on general principles. If we may venture to criticise the plan of the work in one particular we think that marine climates receive less attention than they deserve, while mountain climates have got perhaps more than their share of space; Continental and Marine occupy together 94 pages, while Mountain Climates fill 153 pages. The disparity of course does not extend to the untranslated volumes on Special Climatology. It is much to be wished that this

sound and sensible treatise would be widely read by the general public, who would thereby learn to respect the scientific treatment of difficult problems and to distrust the assertions of empirics. For this reason alone we regret the retention of the centigrade degree and the metric system; but for these our journalists would we doubt not have made much use of the volume, greatly to the improvement of newspaper notes on climatic cycles and the like.

METEOROLOGICAL NEWS AND NOTES.

THE EARTHQUAKE of March 25th, 1903, which was severely felt in the North Midland Counties, was hardly noticeable in Northamptonshire. Mr. C. A. Markham informs us that the most southerly point at which the earthquake occurred was at Kettering. At that town Mr. C. W. Stringer states that he was sitting in his office writing a letter at about 1.27 and distinctly felt his table heave twice, the wave being southerly to northerly, and heard very slight shaking of the windows, &c., and a slight rumbling sound. He recognised it at once as an earthquake and called out to his junior clerk and the office-boy, who were then the only others in the building, enquiring if they had felt it, but they had not; nor had it been felt by any of his family or servants in his house close to the office, nor by several other persons of whom he enquired. At Easton-on-the-Hill the shock was felt by Mr. N. Day, and at Burghley House by Stamford Town, the earthquake was distinctly felt by the Marquis of Exeter, whilst he was lunching, and also by his servants.

THE CLOUD WORLD is the title of a new work on the forms and phenomena of clouds, by the Rev. Samuel Barber, which will shortly be published by Mr. Elliot Stock.

THE SOCIÉTÉ MÉTÉOROLOGIQUE DE FRANCE celebrated the fiftieth anniversary of its foundation on June 3rd, 1903, when telegrams of congratulation were received from the Royal Meteorological Society and from other foreign well-wishers of the Paris society.

THE TREASURY COMMITTEE on the administration of the Parliamentary grant to the Meteorological Council has, we understand, completed the hearing of evidence and is now preparing its Report.

AN INTERNATIONAL KITE COMPETITION will be held on the Sussex Downs on June 25th, under the auspices of the Aëronautical Society of Great Britain, when the Society's silver medal is to be awarded for the highest flight of a single kite (above 3,000 feet) carrying a weight equivalent to that of a meteorograph.

THE VISITATION OF GREENWICH OBSERVATORY took place on Saturday, June 6th, when exceptionally fine weather favoured the inspection of the instruments, and made this annual meeting of scientific men more than usually agreeable.

RAINFALL AND TEMPERATURE, MAY, 1903.

Div.		STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL. Total Fall.	Difference from average 1890-9.	Greatest Fall in 24 hours. Dpth	Date	Days on which ·01 or more fell.	TEMPERATURE. Max. Deg.	Date	Min. Deg.	Date.	No. of Nights below 32°. In shade.	On grass.
			inches.	inches.	in.								
I.	ENGLAND.	London (Camden Square) ...	2·99	+ 1·43	·78	9	17	80·9	30	34·9	13	0	1
II.		Tenterden	2·34	+ ·53	·58	6	13	79·3	30	32·5	13	0	3
,,		Hartley Wintney	3·09	+ 1·23	·53	3	18	79·0	31	32·0	13	1	1
III.		Hitchin	3·42	+ 1·68	1·41	9	14	...	...	...	...	...	...
,,		Winslow (Addington)	3·70	+ 1·99	1·01	9	15	77·0	22	32·0	13	1	4
IV.		Bury St. Edmunds (Westley)	2·54	+ ·70	·71	9	13	79·0	30	35·0	13*f*	0	...
,,		Norwich (Brundall)	1·58	— ·23	·62	8	11	75·2	22	32·0	13	1	4
V.		Winterborne Steepleton	3·36	...	1·06	28	14	75·5	31	31·2	13	2	5
,,		Torquay	3·15	...	·69	2	16	71·3	31	40·3	13	0	0
,,		Polapit Tamar [Launceston]..	2·68	+ ·44	·52	2	19	71·9	25*a*	51·2	30	1	4
VI.		Stroud (Upfield)	4·18	+ 2·29	·56	8	20	75·0	22	39·0	12	0	...
,,		Church Stretton (Woolstaston)	4·70	+ 2·40	1·18	5	18	71·5	22*a*	32·5	12	0	...
,,		Worcester (Diglis Lock)	6·10	+ 4·36	1·85	28	19	...	...	...	...	...	...
VII.		Boston	3·26	+ 1·76	·85	8	14	84·0	31	35·0	12	0	...
,,		Hesley Hall [Tickhill].....	2·51	+ ·97	·47	3	15	79·0	22	29·0	12*g*	3	...
,,		Derby (Midland Railway).....	3·15	+ 1·30	·68	1	20	84·0	31	34·0	13	0	...
VIII.		Bolton (The Park).....	3·78	+ 1·04	·94	2	20	76·4	31	33·9	12	0	2
IX.		Wetherby (Ribston Hall) ...	4·38	+ 2·71	·98	9	17	...	...	...	...	...	...
,,		Arncliffe Vicarage.....	3·48	+ ·09	.49	13	22	...	...	...	...	...	...
,,		Hull (Pearson Park).	2·96	+ 1·15	·90	8	15	71·0	22	30·0	11*h*	2	6
X.		Newcastle (Town Moor)	2·39	+ ·64	·34	1	15	...	...	..	...	...	...
,,		Borrowdale (Seathwaite).....	7·94	+ ·60	1·14	16	20	75·8	31	32·3	12	1	...
XI.	WALES.	Cardiff (Ely).....	3·02	+ ·67	·92	16	14	...	...	...	...	...	...
,,		Haverfordwest	3·37	+ 1·08	1·15	8	14	71·8	26	34·1	12*i*	0	4
,,		Aberystwith (Gogerddan) ...	2·29	— ·23	·56	16	11	78·0	24	22·0	11	3	...
,,		Llandudno.....	1·70	— ·13	·40	3	16	73·0	22*b*	33·5	12	0	...
XII.		Cargen [Dumfries]	3·31	+ 1·17	·74	4	17	74·0	25*j*	33·0	11	0	...
XIII.		Edinburgh (Royal Observatory)	1·17	...	·35	4	13	68·2	31	35·5	11	0	4
XIV.		Colmonell	3·20	+ ·74	·50	16*k*	16	78·0	27*c*	33·0	18	0	...
XV.		Tighnabruaich	3·46	...	·52	13	15	69·0	26*d*	34·0	10	0	...
,,		Mull (Quinish).....	3·32	+ ·17	·73	16	16	...	...	...	...	...	...
XVI.		Loch Leven Sluices	1·63	— ·66	·40	5	11	...	...	...	...	...	...
,,		Dundee (Eastern Necropolis)	1·25	— ·51	·40	3	10	71·5	25	32·0	11	1	..
XVII.		Braemar	1·26	— ·93	·31	4	13	72·4	26	28·1	19	4	13
,,		Aberdeen (Cranford)	2·75	+ ·74	·87	4	13	70·0	31	32·0	8	1	...
,,		Cawdor (Budgate)	2·25	+ ·15	·64	4	14	..	...	...	...	...	...
XVIII		Strathconan [Beauly]	2·20	+ 1·12	...	...	...	...	...	...	...	...	...
,,		Glencarron Lodge.....	4·31	— ·94	1·07	13	17	73·5	27	33·0	19	0	...
XIX.		Dunrobin	...	...	...	...	...	...	...	...	...	...	...
,,		S. Ronaldshay (Roeberry) ...	...	...	...	...	...	...	...	...	...	...	...
XX.	IRELAND.	Darrynane Abbey.....	2·97	+ ·53	·70	2	18	...	...	41·0	10	0	...
,,		Waterford (Brook Lodge) ...	2·29	— ·36	·89	2	16	71·5	27	35·0	18	0	...
,,		Broadford (Hurdlestown) ...	3·77	+ 1·54	·83	29	19	72·0	26*d*	36·0	1	0	...
XXI.		Carlow (Browne's Hill)	3·01	+ ·71	·79	7	16	...	...	...	...	...	...
,,		Dublin (Fitz William Square)	2·38	+ ·48	·48	29	17	68·0	25*c*	40·9	17	0	0
XXII.		Ballinasloe	1·91	— ·54	·35	2	17	74·0	28	35·0	24	0	...
,,		Clifden (Kylemore)	4·35	— ·27	·50	21	18	...	...	...	...	...	...
XXIII		Seaforde.....	3·14	+ ·83	·75	16	19	82·0	25*e*	32·0	10*f*	2	2
,,		Londonderry (Creggan Res.).	2·40	— ·24	·46	4	18	...	...	...	...	...	...
,,		Omagh (Edenfel)	2·56	+ ·02	·35	4, 16	19	77·0	26	35·0	10	0	1

+ Shows that the fall was above the average ; — that it was below it.

a and 31. *b* and 24. *c* and 28. *d* and 27. *e* and 26, 27. *f* and 18. *g* and 13. *h* and 12. *i* and 19. *j* and 27 and 30. *k* and 29.

SUPPLEMENTARY RAINFALL, MAY, 1903.

Div.	STATION.	Total Rain.	Div.	STATION.	Total Rain.
		in.			in.
I.	Uxbridge, Harefield Pk..	3·95	XI.	Llandefaelog-fach.....	2·78
II.	Dorking, Abinger Hall .	3·48	,,	New Radnor, Ednol.....	4·09
,,	Sheppey, Leysdown	3·32	,,	Rhayader, Nantgwillt...	4·96
,,	Hailsham	2·33	,,	Lake Vyrnwy	3·03
,,	Crowborough.....	2·40	,,	Ruthin, Plâs Drâw	3·15
,,	Ryde, Beldornie Tower..	2·40	,,	Criccieth, Talarvor	2·29
,,	Bournemouth, Kempsey	2·73	,,	I. of Anglesey, Lligwy..	1·85
,,	Emsworth, Redlands ...	3·05	,,	Douglas, Woodville.....	2·96
,,	Alton, Ashdell	3·49	XII.	Stoneykirk, Ardwell Ho.	3·94
,,	Newbury, Welford Park	3·77	,,	Dalry, Old Garroch	3·38
III.	Oxford, Magdalen Coll..	4·16	,,	Moniaive, Maxwelton Ho.	2·63
,,	Banbury, Bloxham	5·05	,,	Lilliesleaf, Riddell	2·02
,,	Pitsford, Sedgebrook ...	2·89	XIII.	N. Esk Res. [Penicuick]	2·35
,,	Huntingdon, Brampton.	2·52	XIV.	Dalry, Blair	3·48
,,	Wisbech, Bank House...	2·46	,,	Glasgow, Queen's Park..	...
IV.	Southend	2·22	XV.	Inveraray, Newtown ...	2·98
,,	Colchester, Lexden	3·35	,,	Ballachulish, Ardsheal...	3·25
,,	Saffron Waldon, Newport	2·31	,,	Campbeltown, Redknowe	3·69
,,	Rendlesham Hall	1·82	,,	Islay, Eallabus.....	1·94
,,	Swaffham	2·14	XVI.	Dollar.....	1·73
V.	Salisbury, Alderbury ...	3·13	,,	Balquhidder, Stronvar...	...
,,	Bishop's Cannings	4·18	,,	Coupar Angus Station...	1·23
,,	Ashburton, Druid House	2·71	,,	Blair Atholl	1·66
,,	Okehampton, Oaklands.	2·53	,,	Montrose, Sunnyside ...	1·61
,,	Hartland Abbey	1·95	XVII.	Alford, Lynturk Manse..	2·26
,,	Lynmouth, Rock House	2·74	,,	Keith H.R.S.....	2·59
,,	Probus, Lamellyn	2·49	XVIII.	Fearn, Lower Pitkerrie..	1·24
,,	Wellington, The Avenue	3·60	,,	S. Uist, Askernish	1·48
,,	North Cadbury Rectory	2·60	,,	Invergarry.....	2·86
VI.	Clifton, Pembroke Road	3·38	,,	Aviemore, Alvie Manse.	2·02
,,	Ross, The Graig	4·22	,,	Loch Ness, Drumnadrochit	2·11
,,	Shifnal, Hatton Grange	2·68	XIX.	Invershin	1·80
,,	Wem, Clive Vicarage ...	...	,,	Bettyhill	1·48
,,	Cheadle, The Heath Ho.	2·74	,,	Watten H.R.S.....	1·63
,,	Coventry, Kingswood ...	3·36	XX.	Cork, Wellesley Terrace	3·04
VII.	Market Overton	3·54	,,	Killarney, District Asyl.	3·07
,,	Grantham, Stainby	4·06	,,	Glenam [Clonmel]	4·09
,,	Horncastle, Bucknall ...	1·65	,,	Ballingarry, Hazelfort...	1·71
,,	Worksop, Hodsck Priory	2·49	,,	Miltown Malbay	2·80
VIII.	Neston, Hinderton	3·10	XXI.	Gorey, Courtown House	2·42
,,	Southport, Hesketh Park	2·39	,,	Moynalty, Westland ...	2·58
,,	Chatburn, Middlewood.	3·81	,,	Athlone, Twyford	1·77
,,	Duddon Val., Seathwaite Vic.	3·74	,,	Mullingar, Belvedere ...	1·43
IX.	Langsett Moor, Up. Midhope	4·27	XXII.	Woodlawn	2·63
,,	Baldersby	4·27	,,	Westport, Murrisk Abbey	2·40
,,	Scalby, Silverdale	3·22	,,	Crossmolina, Enniscoe ..	2·49
,,	Ingleby Greenhow Vic..	2·72	,,	Collooney, Markree Obs.	2·31
,,	Middleton, Mickleton ...	2·52	XXIII.	Enniskillen, Portora ...	2·46
X.	Beltingham	2·62	,,	Warrenpoint.....	2·29
,,	Bamburgh	·80	,,	Banbridge, Milltown ...	2·31
,,	Keswick, The Bank.....	2·56	,,	Belfast, Springfield	2·74
,,	Melmerby Rectory	2·89	,,	Bushmills, Dundarave..	2·60
XI.	Llanfrechfa Grange	4·27	,,	Stewartstown	3·06
,,	Treherbert, Tyn-y-waun	5·92	,,	Killybegs	3·09
,,	Castle Malgwyn	2·64	,,	Horn Head	2·69

METEOROLOGICAL NOTES ON MAY, 1903.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Temp. for Temperature; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; TS for Thunderstorm; R for Rain; H for Hail; S for Snow.

ENGLAND.

LONDON, CAMDEN SQUARE.—The earlier part was unsettled with a good deal of R, ·78 in. falling in TSS on 8th. Finer weather prevailed from 12th to 15th. TSS and H on 17th and fine till 27th; broken only by a slight TS on 22nd. Heavy TS at mid-day on 28th, and TSS on 30th and 31st. Mean temp. 55°·0 or 1°·0 above the average.

TENTERDEN.—First part rather wet and cold; fine and warm after 20th; and the last three days very hot with T, but no severe storm. Duration of sunshine 219 hours. TSS on 10th and 31st.

SHEPPEY, LEYSDOWN.—Fine until 6th. On 9th ·54 in., principally H, was recorded in about half-an-hour. Very fine from 18th to 28th. T on four days.

CROWBOROUGH.—The early days were extremely wet, a continuation of the rainy period which began on April 25th. From 8th to 13th was unusually cold, with a little sleet on 12th and ground frost on 13th. It then became warmer and the month closed exceedingly hot. Severe TS from 10 p.m. on 30th to 2 a.m. on 31st.

HARTLEY WINTNEY.—The first part was exceedingly wet and the whole month bitterly cold. No ozone was registered. TSS on 4 days and L on 3.

COLCHESTER, LEXDEN.—R was measured on 17 consecutive days ending on May 11th; this period was mild with little sunshine. The latter half was warm and bright with light winds from N. or E. On 10th and 11th 1·98 in. of R fell in 26 hours, causing the highest floods since 1894. TS on 9th.

WINTERBORNE STEEPLETON.—R 1·77 in. above the average of 10 years. Mean temp. 51°·5 or 1°·2 higher than the average of 10 years. TS on 28th.

TORQUAY, CARY GREEN.—R 1·19 in. above the average. Duration of sunshine 221·3 hours, being 9·4 hours below the average. Mean temp. 53°·8 or 0°·7 above the average. Mean amount of ozone 5·2. Max. 7·5 on 3rd with S.E. wind; min. 2·0 on 5th with W.N.W., and on 28th with N.E. wind.

LYNMOUTH, ROCK HOUSE.—Cold in the early part, especially on 16th, 17th and 18th. The latter part was warm with very light E. airs.

NORTH CADBURY RECTORY.—Changeable with no extremes. R considerable and temp. decidedly high. Grass frosts were very few and slight. T on 3 days and L on one.

CLIFTON, PEMBROKE ROAD.—Rainy and unsettled till 17th with a cold spell from 9th to 12th. Fine and warm from 21st to 26th with cloudless skies, then thundery and sultry to the end. TSS on 4 days and T only on 2. R 1·15 in. above the average.

ROSS, THE GRAIG.—Mean temp. 53°·5 or 0°·8 above the average of 33 years. R nearly double the average, the fall for 37 days ending on 31st being the highest yet measured in that period of the year except in 1886. No frost in the screen, and only 0°·2 on one night on grass.

BOLTON, THE PARK.—Strong contrasts of cloudiness and sunshine, cold and warm periods. R fell each day till 11th, being persistent from the morning of 2nd to the evening of 5th; the amount of R during the 11 days was 3·03 in., and the duration of sunshine only 4 hrs. 25 mins. Remarkably warm and bright from 21st to the end. Mean temp. 49°·8 or 0°·1 above the average. Bright sunshine occurred on 23 days, totalling 121 hrs. 40 mins., or 34 hrs. 5 mins. below the average.

WALES AND THE ISLANDS.

ABERYSTWITH, GOGERDDAN.—Very cold on several occasions; 10° of frost on 11th, working havoc with fruit, flower and vegetable.

DOUGLAS, WOODVILLE.—Cold, wet and wintry to 20th, when it suddenly changed to brilliant sun all day, albeit accompanied by cold E. winds and nightly frosts. The sunshine had a marvellous effect in bringing out the belated foliage of earlier forest trees, but otherwise was no "unmixed blessing" horticulturally. Ash and poplar still showed little sign even of bud at the end.

SCOTLAND.

LILLIESLEAF, RIDDELL.—The wind continued in the E. for over two-thirds of the month. The prevalence of easterly winds for the last six months is very remarkable. Sudden change in temp. on 22nd, and on 31st shade max. was 77°.

MULL, QUINISH.—Cold, wet and backward until 22nd, when wind shifted to the S. with heavy R. The summer heat of the rest of the month worked wonders and brought on crops and foliage marvellously.

COUPAR ANGUS.—Although not severe, it was cold and harsh up to the 24th, when a sudden change set in, and a noteworthy feature of the month was the abnormally high day temp. of the last week. Mean temp. for the month 42°·0.

BETTYHILL.—There was but little R, and the weather was favourable for out-door work. Except during the last week the wind was cold and dry.

WATTEN, H. R. S.—The opening week was cold, cloudy and wet; the middle cloudy, with cold N. winds; the last week mild and fine.

IRELAND.

CORK, WELLESLEY TERRACE.—R ·86 in. above the average, and for the past five months 6·65 in. above the average. On the afternoon of 30th ·50 in. of R fell in 45 mins. Mean temp. 1°·9 below the average. T and L on 6th.

DARRYNANE ABBEY.—The first three weeks were wet and ungenial, and the last 10 days fine and warm with a TS on the afternoon of the 29th.

MILTOWN MALBAY.—May opened genial and seasonable with fine vegetation till 9th, when chilling cold winds from N. set in with occasional R and blustery weather up to 23rd, when heat returned. T 5th and 7th, T and L on 29th.

DUBLIN, FITZWILLIAM SQUARE.—Two seasons were presented by May, 1903, cold, dull and rainy during the first 16 days, whereas the second half was fair, bright, dry and summerlike, except on 29th and 30th, when heavy R fell. Mean temp. 52°·9 or 0°·8 above the average. H on 12th and L on 19th.

OMAGH, EDENFEL.—The weather of the first half was apparently but little improvement on that of April. The day temp. was below the normal, and most of the R fell by day, but the night temp. and the mean of the first fortnight were above the average. The second half was, however, in all respects, the most favourable for many years. With a max. temp. of 77° on 26th and 5 consecutive days above 70°, all the season's lee-way was made up.

THE FIVE MONTHS' RAINFALL OF 1903.

Aggregate Rainfall for January—May, 1903.

Stations.	Diff. from Aver.	Per cent. of Aver	Stations.	Diff. from Aver.	Per cent. of Aver.	Stations.	Diff. from Aver.	Per cent. of Aver.
	in.			in.			in.	
London	+2·69	135	Arncliffe	+ ...	...	Braemar	+ 9·86	182
Tenterden	+1·37	115	Hull	+1·89	122	Aberdeen	+3·08	128
Hartley Wintney	+4·18	148	Newcastle	+ ·23	103	Cawdor	+4·71	147
Hitchin	+3·87	149	Seathwaite	+ 23·05	145	Glencarron	+ 15·89	146
Winslow	+3·58	145	Cardiff	+5·71	142	Dunrobin	...	...
Westley	+ ·57	107	Haverfordwest	+6·51	142	Darrynane	+2·48	114
Brundall	— ·27	97	Gogerddan	+4·87	132	Waterford	+4·21	130
Alderbury	+4·87	150	Llandudno	+5·13	151	Broadford	+6·39	154
Ashburton	+5·86	131	Dumfries	+ 11·17	169	Carlow	+6·32	151
Polapit Tamar	+5·89	147	Lilliesleaf	+7·36	170	Dublin	+2·77	128
Stroud	+5·60	159	Colmonell	+4·33	127	Mullingar	+7·48	158
Woolstaston	+5·50	153	Glasgow	+ ...	...	Ballinasloe	+5·94	146
Boston	+2·84	142	Inveraray	+ 11·93	144	Clifden	+5·40	119
Hesley Hall	+1·87	126	Islay	+6·47	140	Crossmolina	+8·04	141
Derby	+3·76	148	Mull	+7·32	135	Seaforde	+4·74	136
Bolton	+4·03	131	Loch Leven	+ 10·70	183	Londonderry	+3·73	126
Wetherby	+5·58	169	Dundee	+1·86	119	Omagh	+8·59	163

CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, DECEMBER, 1902.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Date.	Absolute. Minimum. Temp.	Date.	Average. Max.	Min.	Dew Point.	Humidity.	Absolute. Max. in Sun.	Min. on Grass.	Total Rain. Depth.	Days.	Aver. Cloud.
	°		°		°	°	°	0-100	°	°	inches		
London, Camden Square	56·8	17	22·5	7	44·9	37·6	38·5	91	66·2	18·9	1·51	12	7·5
Malta	67·0	1	41·0	26	60·3	50·7	47·6	76	109·6	38·5	3·23	13	5·0
Lagos, W. Africa	91·1	14	66·1	29	88·2	76·9	75·8	80	142·0	...	·00	0	...
Cape Town	94·0	23	45·7	26	78·1	59·2	56·1	65	...	...	·29	2	3·1
Durban, Natal	91·4	9	58·2	20	83·3	66·2	...	...	147·3	...	3·96	18	6·6
Mauritius	88·5	1	68·0	31	84·4	73·4	71·1	79	153·5	63·3	9·85	27	7·5
Calcutta	84·0	18	48·4	30	77·2	56·1	51·9	61	137·0	43·9	·66	1	2·0
Bombay	88·2	2	67·1	21	83·9	72·0	67·2	71	137·7	56·9	·81	5	3·3
Madras	86·3	11	63·9	29	82·9	71·9	70·1	83	140·1	59·0	9·18	11	5·8
Kodaikanal	67·1	30	42·2	29	60·8	49·4	48·7	82	129·2	30·1	9·84	13	5·5
Colombo, Ceylon	89·4	18	71·6	30	86·9	73·9	72·0	80	151·5	69·0	6·43	11	5·6
Hongkong	76·9	2	51·1	14	68·6	61·0	56·5	75	130·1	...	2·97	13	8·2
Melbourne	101·7	5	48·0	30	75·5	55·6	52·0	68	160·1	39·8	4·35	11	6·4
Adelaide	99·0	4	48·9	1	80·4	58·7	50·9	51	161·1	40·1	2·57	10	5·3
Coolgardie	108·6	20	47·8	10	89·5	59·1	...	...	166·2	...	·17	3	3·8
Sydney	100·0	24	60·5	1	78·3	65·0	60·9	68	140·1	53·0	2·80	16	5·7
Wellington	71·0	12	41·0	4	63·6	50·1	45·5	65	136·0	33·0	3·74	19	6·2
Auckland	75·5	14	50·0	7	67·4	54·5	47·7	62	138·0	46·0	2·83	17	4·7
Jamaica, Negril Point	87·7	11	66·2	21*a*	84·9	70·8	70·4	78	...	...	4·73	8	...
Trinidad	97·0	1	66·0	7	87·5	69·5	75·3	92	164·0	60·0	2·89	7	...
Grenada	85·0	16	72·0	8	82·7	73·5	71·7	76	148·8	...	5·27	22	2·9
Toronto	45·8	3	—3·3	9	31·1	17·6	22·0	81	62·4	—10·2	2·22	17	7·5
Fredericton, N.B.	51·8	23	—16·8	13	26·7	7·8	6·0	60	...	...	4·35	14	5·6
Winnipeg	35·2	31	—30·7	25	14·1	—5·0	...	...	...	...	1·50	9	4·8
Victoria, B.C.	53·1	25	32·2	2	44·9	37·1	37·8	89	...	...	6·23	18	8·3
Dawson	29·0	14	—51·0	22	-16·7	—28·2	...	...	...	...	·80	4	5·3

a—and 23.

MALTA.—Mean temp. of air 55°·2, or 1°·1, below; mean hourly velocity of wind 12·2, or 1·1 above averages. Mean temp. of sea 63°·9. TSS on 3 days. J. F. DOBSON.

LAGOS.—The Harmattan prevailed during the latter half of month. A. CLEMINSON.

Mauritius.—Mean temp. of air 0°·1, dew point 2°·8, and R 4·92 in., above averages, and mean hourly velocity of wind 0·4 miles below average. T. F. CLAXTON.

MADRAS.—Rainfall about 75 per cent. above average. R. D. JONES.

KODAIKANAL.—Bright sunshine 124·9 hours. Mean temp. of air 54°·1. Mean velocity of wind 317 miles per day. C. P. BUTLER.

COLOMBO.—Mean temp. of air 79°·5, or 0°·4 above, of dew point 1°·0 above, and R ·17 in. above, averages. Mean hourly velocity of wind 7·8 miles. H. O. BARNARD.

HONGKONG.—Mean temp. of air 64°·6 or 2°·2 above, R 1·96 in. above, averages. Sunshine 71·9 hours, or 117·8 below, average. Mean hourly velocity of wind 11·2 miles; prevailing direction E.N.E. F. G. FIGG.

Adelaide.—Mean temp. 1°·9 below, and R 1·75 in. above, averages. C. TODD, F.R.S.

Sydney.—Mean temp. 1°·8 above, humidity 0°·8 below. and R ·29 in. above, averages. H. C. RUSSELL, F.R.S

Wellington.—Mean temp. 1°·8 below, and R ·75 in. below, averages. A. H. GORE.

Auckland.—Mean temp. nearly two degrees below average, R half an inch above average. T. F. CHEESEMAN.

TRINIDAD.—R 1·91 in. below the 40 years' average. J. H. HART.